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ABSTRACT

This manual contains a work sample intended to assess a handicapped student's interest in and potential to enter a training program in small parts assembly or in a similar job. Section 1 describes the assessment, correlates the work performed and worker traits required for completing the work sample, and lists related occupations and DOT codes. Instructions to the evaluator are provided in the next section. The conditions and administration equipment are detailed, and the set-up and breakdown procedures are illustrated. The section on administration provides a student orientation including student material with an explanation and illustration of equipment and/or procedures. Instructions for task procedures actions to be taken, as well as post sample interview topics are also covered. Section 4 explains the method of scoring and provides forms. Section 5 lists technical data (norms, reliability, validity) to be included in a supplement to this manual. Contents of the section on maintenance and construction include information on tool and equipment maintenance, a materials list (equipment, source, price), and assembly instructions. Section 7 cites references. An appendix defines terms. (YLB)

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SMALL PARTS ASSEMBLER

Work Sample

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TABLE OF CONTENTS

SECTION HEADING		PAGE
I.	INTRODUCTION	1
	A. Assessment Description	1
	B. Related Occupations	5
II.	INSTRUCTIONS TO THE EVALUATOR	6
	A. Work Sample Conditions	6
	B. Administration Equipment	6
	C. Set-up and Breakdown	7
III.	ADMINISTRATION	10
	A. Student (client) Orientation	10
	B. Instruction and Demonstration	11
IV.	SCORING	14
	A. Explanations	14
	B. Forms	14
V.	TECHNICAL DATA	18
VI.	MAINTENANCE AND CONSTRUCTION	19
	A. Maintenance	19
	B. Materials List	19
	C. Assembly Instruction	20
VII.	REFERENCES	21
	APPENDIX	

I. INTRODUCTION

A. Assessment Description

The Small Parts Assembler Work Sample is intended to assess a student's interest in and potential to enter a training program in Small Parts Assembly (DOT 706.684-022) or in a similar job.

The Small Parts Assembler falls within the Metal Unit Assemblers and Adjusters N.E.C. Occupational Group Arrangement and the Production Work Worker Trait Group.

* * * *

The work performed and worker trait groups required for completing the Small Parts Assembler Work Samples are as follows:

WORK PERFORMED	WORKER TRAITS REQUIRED	
Matches pairs of discs.	GED	R-2, M-2, L-2, T-2
	SVP	1
	APT	G-3, V-4, N-3, S-3, P-3, K-3, F-3, M-3
	WA	1,3,9,10
	WS	2
	WC	1
	PD	1
Aligns holes in discs with holes in jig table.	GED	R-1, M-1, L-1, T-1
	SVP	1
	APT	G-4, V-4, N-4, S-4, P-3, Q-5, K-3, F-3, M-2
	WA	1
	WS	2
	WC	1
	PD	1
Runs bolts through sets of holes.	GED	R-1, M-1, L-1, T-1
	SVP	1
	APT	G-4, V-4, N-4, S-4, P-4, Q-5, K-4, F-4, M-3
	WA	2
	WS	2
	WC	1
	PD	1
Positions disc below table.	GED	R-2, M-1, L-2, T-2
	SVP	1
	APT	G-4, V-4, N-4, S-3, P-3, Q-4, K-3, F-3, M-2, E-5, C-5
	WA	1, 10
	WS	2
	WC	1
	PD	1, S, 4, 6
Lines up holes and index marks.	GED	R-2, M-1, L-2, T-2
	SVP	1
	APT	G-4, V-4, N-4, S-3, P-3, Q-4, K-3, F-4, M-2, E-5, C-5
	WA	1, 10
	WS	2
	PD	1, S, 4, 6
	WC	1

WORK PERFORMED	WORKER TRAITS REQUIRED
Starts a nut onto a bolt.	GED R-2, M-1, L-2, T-2 SVP 1 APT G-4, V-4, N-4, S-4, P-4, Q-4, K-3, F-3, M-3, E-5, C-5 WA 10 WS 2 PD S, 4 WC 1
Holds disc with one hand while tightening nut with other.	GED R-2, M-1, L-2, T-2 SVP 1 APT G-4, V-4, N-4, S-4, P-4, Q-4, K-3, F-3, M-3, E-5, C-5 WA 1 WS 2 PD S, 4 WC 1
Repeat steps 3 and 6 for each of the other holes.	See steps 3 and 6
Repeat the above steps for the second pair of discs.	
Check that all nuts are finger tight.	GED R-1, M-1, L-1, T-1 SVP 1 APT G-4, V-4, N-4, S-4, P-4, Q-4, K-4, F-3, M-3, E-5, C-5 WA 1, 10 WS 2 PD S, 4 WC 1
Holds wrench on nut.	GED R-1, M-1, L-1, T-1 SVP 1 APT G-4, V-4, N-4, S-3, P-4, Q-4, K-4, F-3, M-3, E-5, C-5 WA 1, 10 WS 2 PD S, 4 WC 1

WORK PERFORMED	WORKER TRAITS REQUIRED
Using a screwdriver, tighten each bolt one-half turn.	GED R-1, M-1, L-1, T-1 SVP 1 APT G-4, V-4, N-4, S-4, P-4, Q-4, K-4, F-3, M-3, E-5, C-5 WA 1, 10 WS 2, 10 PD S, 4 WC 1
Repeat steps 12 and 13 for the remaining bolts.	See Steps 12 and 13.
Notify the instructor that you are finished.	GED R-1, M-1, L-1, T-1 SVP 1 APT G-4, V-4, N-4, S-4, P-4, Q-4, K-4, F-4, M-4, E-5, C-5 WA 4 WS 4 PD S, 5

B. Related Occupations

Product Assembler Work Sample,
DOT Description:
Product Assembler (706.684-018)

Related Occupations	DOT Code
AIR CONDITIONING COIL ASSEMBLER	706.684-010
ASSEMBLER (OFFICE MACH.)	706.684-014
ASSEMBLER, SMALL PARTS	706.684-022
ASSEMBLER, TYPE BAR & SEGE[illegible]	706.684-024
ATOMIZER ASSEMBLER	706.684-030
BAR & FILLER ASSEMBLER	706.684-034
BEARING RING ASSEMBLER	706.684-038
BENCH HAND (MOT. & BICYCLE)	706.684-046
BENCH ASSEMBLER	706.684-042
DRAWER UPFITTER	706.684-050
FITTER II	706.684-054
HYDRAULIC CHAIN ASSEMBLER	706.684-058
LOCK ASSEMBLER, FURNITURE	706.684-070
LOCK ASSEMBLER, HARDWARE	706.684-074
LOCK INSTALLER	706.684-078
ASSEMBLER, PRODUCT	706.684-018

II. INSTRUCTIONS TO THE EVALUATOR

A. Work Sample Conditions

The Small Parts Assembler Work Sample is to be administered indoors with moderate noise level from adjacent assembly areas, little dust, and good overhead lighting. The sample involves light to medium work, reaching, handling, fingering, and seeing and can be done by a two-armed person with good eyesight, from a chair or wheelchair.

The sample was designed to closely similate work in product assembly, any industry, using small parts. The sample is not physically hazardous in any way and does not require special safety equipment, although precautions regarding the Safety and Health requirements should be adhered to, as well as those safety factors which may be encountered in local industry and unique job requirements.

B. Administration Equipment

The following equipment is required prior to administration.

Evaluator Equipment:

- manual for Small Parts Assembler Work Sample
- Task Observation Sheet
- Stop Watch

Student Equipment:

- Open End Wrench
- Small Parts Assembly Work Sample
- Table
- Chair
- Screwdriver

Set-up and Breakdown

The Work Sample is placed in the front center of the table. Screwdriver is placed to the right of the work sample, and wrench is placed to the left of the work sample. Correct initial set-up is shown in Fig. 1.

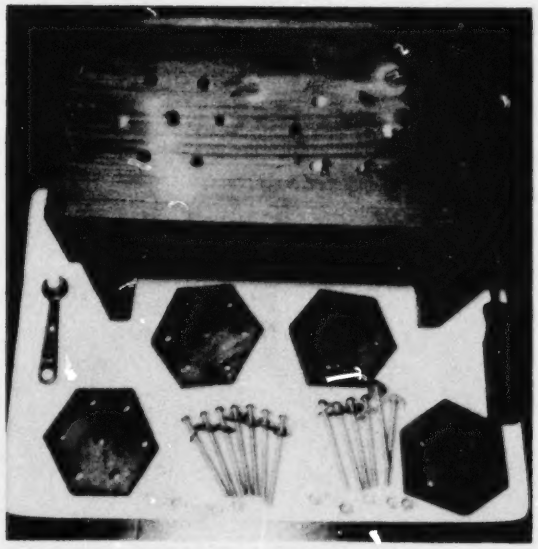
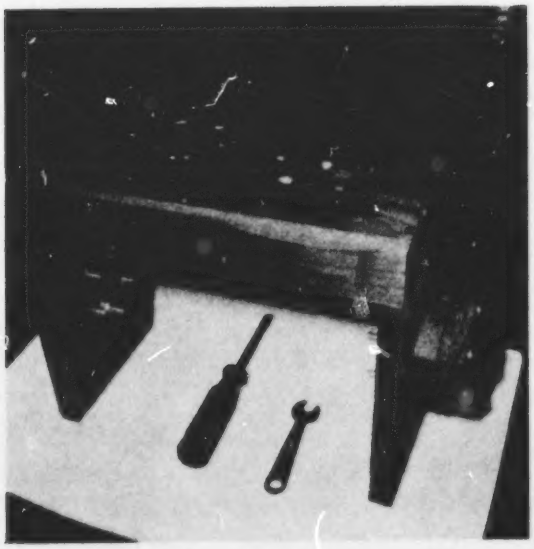


Fig. 1

Nuts, bolts, and discs have been removed from their storage position on the sides of the work sample and are placed conveniently in front of the work sample as shown in above Fig. 1, above.
The evaluator will point out the index marks on the side of each disc, and the index marks on the jig table. While giving instructions the evaluator stands to the side of the student so as not to obstruct the student's view. No alterations are required for wheelchair or left handed persons.

Fig. 2

Figure 2 shows a correct sample work-site set-up. When the sample is completed have the student remove all nuts and bolts and place the discs on the side of the jig table, bolting them back in their original storage position. Tools are returned to the evaluator for safe keeping. Fig. 3 shows correct position of parts in a storage position.



Work Sample in Storage Position
Fig. 3

Timing Procedures:

Time is not a factor in scoring this work sample, and is kept for informational purposes only. Timing begins when the student indicates that he understands the instructions and picks up the first disc, and ends when he tightens the last bolt and notifies the evaluator that he is finsihed.

Quality Checks:

Quality is checked by comparing the completed work sample to the answers on the task observation sheet.

III. ADMINISTRATION

A. Student Orientation

Read or paraphrase the following information to the student:

> The Work Sample that you are going to do is called the Small Parts Assembly work sample.
> The work that you will be doing is like the assembly work that Small Parts Assemblers do in industry. On this work sample you will match the discs that are the same. There are two matching pairs of discs.
> Your job on the work sample is to assemble the matching pairs of discs to the jig table. One disc of each matching pair will be bolted to the top, and the other you will assemble to the bottom of the jig table. I'll show you how to do the work in a minute, but first, do you have any questions?

B. Instructions and Demonstrations

Statement	Action
Match up the pairs of discs by lining index marks and lining up holes.	Point to index marks, and to holes in discs.
Align holes in discs with holes in jig table, one disc on top.	Indicate which discs match the holes in jig table.
Place washer on a bolt and run the bolt through holes in the top disc and the table.	Point to the position of the top discs.
Position the matching disc below the jig table.	
Line up index marks and push disc up onto bolts with the words top & bottom visible.	Indicate index mark alignment.
Start a nut onto a bolt.	
Hold disc with one hand while tightening nut with the other.	Point to disc under the jig table.
Repeat steps 3 and 6 for each of the remaining holes.	
Repeat the above steps 1 through 8 for the second pair of discs.	
Check that all nuts are finger tight.	
Hold wrench on nut.	Point to nuts under the jig table.

Statement	Action
Using a screwdriver, tighten each bolt one-half turn.	
Repeat steps 11 and 12 for the remaining bolts.	
Notify the evaluator that you are finished.	
Do you understand the instructions? Go ahead and begin.	

Remove all nuts and bolts. Turn jig table on end with side holes to the top. Insert a bolt with a washer through two matching discs. Line up index marks on discs so that they are together, and they coincide with index marks on side of jig table. Pass the bolt through the hole in the jig table and thread a nut on by hand. Repeat for each hole. Tighten all nuts finger tight. Repeat these steps for the other set of matching discs on the other side of the jig table.

Suggested Post Sample Interview Topics:

1. Like or dislike for the course.

2. Like or dislike for the course tasks.

3. Additional information needed about course.

IV. SCORING

A. Explanations

1. Method of scoring:

   Productivity will not be used in scoring.
   Quality will be assessed by the number of bolts properly tightened in their proper place.

2. Work performance factors to be observed:

   - Student able to follow verbal instructions.
   - Student has sufficient dexterity to manipulate objects.

B. Forms

1. Task Observation Record.

School _____

SMALL PARTS ASSEMBLER WORK SAMPLE

Task Observation Record

Critical Errors (3 pts each)

_____ 1. Discs not matched.

_____ 2. Discs not bolted to top and bottom of jig table.

_____ 3. Bolts left off.

_____ 4. Nuts left off.

Observational explanations for 1 through 4.

Task Quality Errors [1 pt. each]

_____ 5. Nuts not tightened.

_____ 6. Washers left off.

Observational explanations for 5 and 6.

Put additional comments and observations below.

_____ Critical errors

_____ Task quality errors

_____ Min _____ Sec Total time

_____ Date taken

_____ Evaluator

_____ Student

V. TECHNICAL DATA

A supplement to this manual is being developed at the time of this printing. It will include:

1. Norms
2. Reliability, test-retest studies
3. Validity
   a. Content validity - established through the Course Analysis based on methods suggested by U. S. Dept. of Labor Job Analysis techniques.
   b. Predictive Validity
      To be established through follow-up studies of students previously tested.

VI. MAINTENANCE AND CONSTRUCTION

A. Maintenance

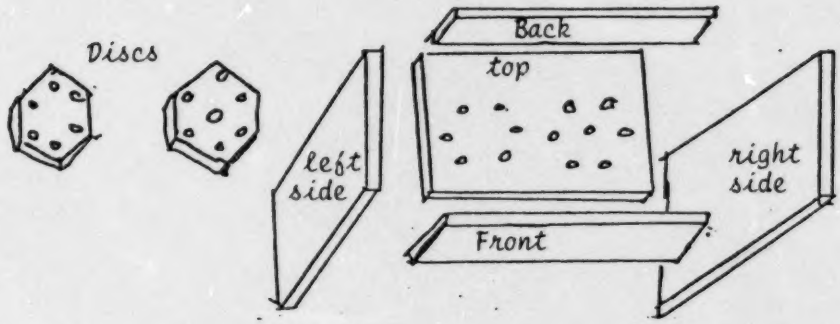
After each administration the evaluator should see that all four discs are bolted in place on the sides of the jig table.

A count should then be made of the thirteen nuts, bolts, and washers, one wrench, and one screwdriver.

B. Materials List

Equipment	Source	Price
1 Wrench, 7/16"	Sears Roebuck	1.95
1 Screwdriver, 6"	Sears Roebuck	1.75
13 1/4X3" RH Bolts	Hardware Store	.10/ ea.
13 Nuts	Hardware Store	.05/ ea.
13 Washers	Hardware Store	.02/ ea.
1 ft. 10 X ¾" pine	School I.A. Dept.	N/C
3 ft. 1" C 6" pine	School I.A. Dept.	N/C

c. Assembly Instructions



JIG TABLE PARTS

	T	W	L
Front	¾"	X 3"	X 10"
Back	¾"	X 1¾"	X 10"
Top	¾"	X 3"	X 10"
Sides	1"	X 6"	X 9" (2) needed
Discs	3¼"	X 1"	(4) needed

VII. REFERENCES

Korn, T. (ed.) A Work Sample Style Manual. Interface No. 10. Menomonic, WI.: Research and Training Center, University of Wisconsin - Stout, 1976.

United States Department of Labor, Dictionary of Occupational Titles, 3rd Edition. Washington, D. C.: United States Government Printing Office, 1965.

Handbook for Analyzing Jobs, Washington, D. C.: United States Government Printing Office, 1972.

Occupational Outlook Handbook, 1970-71 Edition. Washington, D. C.: United States Government Printing Office, 1970.

APPENDIX

Definition of Terms

GED - Is the general level of learning and reasoning acquired through schools, experience and self study. There are six GED difficulty levels, ranging from (6) the most difficult to (1) the simplest.

SVP - Is the special vocational preparation and training in terms of the total time required to prepare for an occupation. It ranges from SVP 1, short demonstrations only, to SVP 9, over ten years.

APT - Refers to aptitudes, which is the quickness and ease with which you can learn to do something. Aptitude definitions are included on a separate page in this manual.

WA - Work Activities:

1. Dealing with things and objects.
2. Involving business contacts.
3. Of a routine, definite, organized nature.
4. Involving direct personal contact to help or instruct others.
5. Resulting in recognition or appreciation from others.
6. Involving the communication of ideas and information.
7. Of a scientific and technical nature.
8. Involving creative thing.
9. Involving processes, methods or machines.
10. Involving working on or producing things.

WS - Work situations are the conditions under which the work involved in any occupation takes place. There are ten types described and they have been related to the 66 Worker Trait Groups in the Guide for Occupational Exploration. They are:

1. Performing duties which change frequently.
2. Performing duties of a routine nature.
3. Planning and directing an entire activity.
4. Dealing with people.
5. Influencing peoples opinions, attitudes, and judgements.
6. Working under pressure.
7. Making decisions using personal judgement.
8. Making decisions using standards that can be measured or checked.
9. Interpreting and expressing feelings, ideas, or facts.
10. Working within precise limits or standards.

PD - Physical Demands are the physical requirements of an occupation and are described in six areas as follows:

1. Lifting, carrying, pushing and/or pulling.
2. Climbing and/or balancing.
3. Stooping, kneeling, crouching, and/or crawling.
4. Reaching, handling, fingering, and/or feeling.
5. Talking and/or hearing.
6. Seeing.

WC - Working Conditions are the physical surroundings of a worker in a job. The DOL lists six different types as follows:

1. Inside or outside.
2. Extremes of cold plus temperature changes.
3. Extremes of heat plus temperature changes.
4. Wet and humid.
5. Noise and vibrations.
6. Hazards.

Aptitudes are rated on a scale of 1 - Highest to 5 - Lowest as follows:

1 - Top 10% of the population
2 - Top third not including the top 10%
3 - Middle third of the population
4 - Lowest third not including lowest 10%
5 - Lowest 10%

The following are the definitions of the aptitudes:

G - General Learning Ability - The ability to "catch on" or understand instructions and underlying principles; the ability to reason and make judgements. Closely related to doing well in school.

V - Verbal Aptitude - The ability to understand meaning of words, and to use them effectively. The ability to comprehend language, to understand relationships between words and to understand meaning of whole sentences and paragraphs.

N - Numerical Aptitude - Ability to perform arithmetic operations quickly and accurately.

S - Spatial Aptitude - Ability to think visually of geometric forms and to comprehend the two-dimensional representation of three-dimensional objects. The ability to recognize the relationships resulting from the movement of objects in space.

P - Form Perception - Ability to perceive pertinent detail in objects or in pictorial or graphic materials. Ability to make visual comparisons and discriminations and see slight differences in shapes and shadings of figures and widths and lengths of lines.

Q - Clerical Perception - Ability to perceive pertinent detail in verbal or tabular material. Ability to observe differences in copy, to proofread words and numbers, and to avoid perceptual errors in arithmetic computation. A measure of speed of perception which is required in many industrial jobs even when the job does not have verbal or numerical content.

K - Motor Coordination - Ability to coordinate eyes and hands or fingers rapidly and accurately in making precise movements with speed. Ability to make a movement response accurately and swiftly.

F - Finger Dexterity - Ability to move the fingers, and manipulate small objects with the fingers, rapidly and accurately.

M - Manual Dexterity - Ability to move the hands easily and skillfully. Ability to work with the hands in placing and turning motions.

MR - Mechanical Reasoning - The ability to understand mechanical principles (pulleys, gears, etc)

E - Eye-Hand-Foot Coordination - Moving the hands and feet together in response to visual signals or observations.

C - Color Discrimination - Seeing likenesses or differences in colors or shades. Identifying or matching certain colors. Selecting colors which go well together.